

Chlorhexidine Gluconate (CHG) Compatibility

Chlorhexidine gluconate (CHG) is a unique skin antiseptic with a vital characteristic of excellent persistent antimicrobial activity.¹ To maintain persistence, it is important to utilize skincare products that are compatible with the CHG molecule and not neutralize the antiseptic effect. Compatibility is a complicated issue and is confounded by multiple variables:

- Number of offending ingredients in the lotion or cream used
- Amount or concentration of the offending ingredient(s)
- How often the lotion or cream is applied
- Viscosity of the lotion or cream

CHG has some important limitations:

- CHG is absorbed and “binds” onto the fibers of certain fabrics, particularly cotton.²
- CHG is most active at pH 5.5-7.0, and may precipitate out of an aqueous solution outside of this range.³
- CHG is a cationic molecule, and its antimicrobial activity is reduced in the presence of anionic and some nonionic substances.²

CHG is Ingredient and Formulation Dependent

Many soaps, shampoos, deodorants, lotions, barrier creams and other skincare products commonly used at home and in healthcare settings contain anionic ingredients, such as those listed in the box on this page. Using such products in conjunction with CHG or other cationic disinfectants can reduce the effect of the antimicrobial agent to a level that may be clinically significant. In most circumstances, there will be no visible signs of incompatibility.²

A standard measure of a skincare product's compatibility with CHG is through accepted human or porcine skin testing in a manner consistent with how the 2% CHG Cloth is used in clinical practice. Established testing protocol involves controlled, sequential use of both products with the 2% CHG Cloth applied first, followed by the skincare product, with several subsequent tests for residual CHG and log₁₀-reduction of clinically relevant microbial counts.⁴⁻⁶

We **strongly recommend** contacting the skincare product manufacturer directly regarding CHG compatibility. In the absence of adequate *in vivo* test data, an evaluation of a product's anionic and nonionic ingredients will provide an idea of its relative compatibility with CHG. It is important to review products used in conjunction with the 2% CHG cloth to help ensure optimal outcomes for your facility and patients. Ask the manufacturer of skincare products if their lotion or cream has CHG compatibility data. Published outcomes studies using the 2% CHG Cloth for prevention of surgical site infection have included careful assessment of skincare products to ensure full CHG activity.

INGREDIENTS COMMONLY FOUND IN SKINCARE PRODUCTS, WHICH MAY INHIBIT CHG ACTIVITY*

alginate acid	sodium benzoate
aluminum salts	sodium bicarbonate
aminomethylpropanol	sodium borate
ammonium lactate	sodium carbonate
benzoic acid	sodium carboxymethyl cellulose
boric acid	sodium caseinate
carbomer sodium	sodium cetearyl sulfate
cellulose gum	sodium chloride
chlorides	sodium citrate
citric acid	sodium cocoyl isethionate
disodium cocoamphodiacetate	sodium hyaluronate
glycine	sodium hydroxide
hydrolyzed collagen	sodium hypochlorite
lactic acid	sodium lactate
lauroamphoacetate	sodium laureth sulfate
lauroyl lactate	sodium lauryl sulfate
magnesium aluminum silicate	sodium metabisulfite
magnesium sulfate	sodium phosphate
minomethylpropanol	sodium stearate
morpholinium ethosulfate	sodium sulfite
olefin sulfonate	stearic acid
oleic acid	taurine
potassium phosphate	tetrasodium EDTA
potassium sorbate	triethanolamine
potassium stearate	triethanolamine stearate
proline	

*The above ingredient list is not intended to be all-inclusive

References: 1. Mangram AJ, et al., *Guideline for prevention of surgical site infection, 1999*. Centers for Disease Control and Prevention, Hospital Infection Control Practices Advisory Committee, Atlanta GA. 2. Denton GW, *Chlorhexidine*. In Seymour S. Block (Ed.) *Disinfection, sterilization, and preservation, 4th Edition*, Lea & Febiger, Williams & Wilkins, Media PA, 1991:279. 3. <http://www.medscape.com/druginfo/monograph?cid=med&drugid=4264&drugname=Chlorhexidine+Gluconate+Misc&monotype=monograph&secid=6> accessed 2/16/2010. 4. Marino C, Cohen M, *Prevention of hand dermatitis in the health care setting. Safety and Health Assessment and Research for Prevention (SHARP) Program*, Washington Department of Labor and Industries, Olympia WA, Jul 2001 (available at <http://www.lni.wa.gov/Safety/Research/Pubs>). 5. Benson, L et al. *The effects of surfactant systems and moisturizing products on the residual activity of a chlorhexidine handwash using a pigskin substrate. Infection Control Hospital Epidemiology* 1990; 11:67-70 6. Frantz, SW et al. *Chlorhexidine gluconate (CHG) activity against clinical isolates of vancomycin-resistant Enterococcus faecium (VREF) and the effects of moisturizing agents on CHG residue accumulation on the skin. Journal of Hospital Infection* 1997; 37: 157-164.